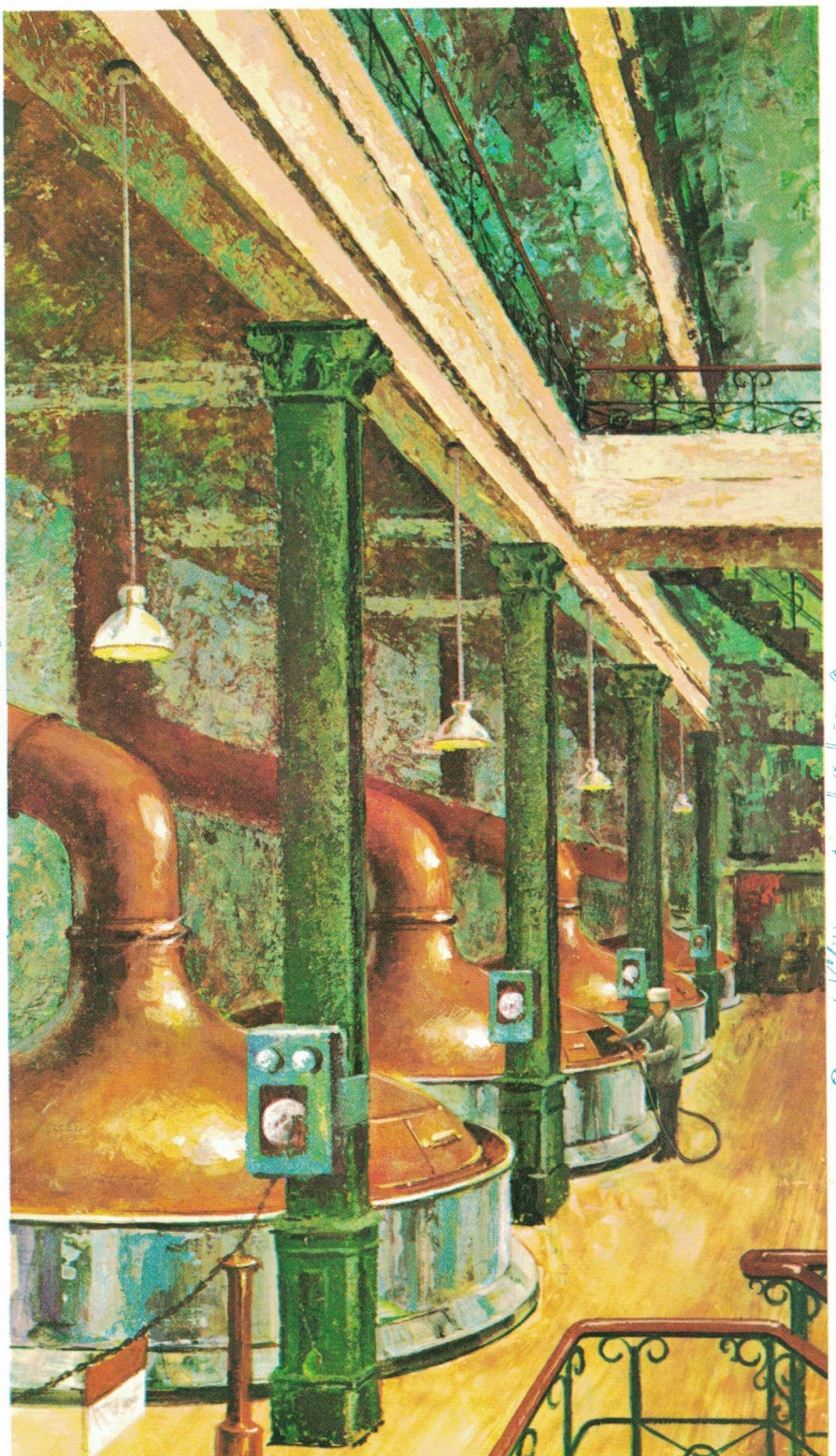
ON premise
VOLUME 14 — NO. 3
The magazine for taverns and restaurants published by The Jos. Schlitz Brewing Co.

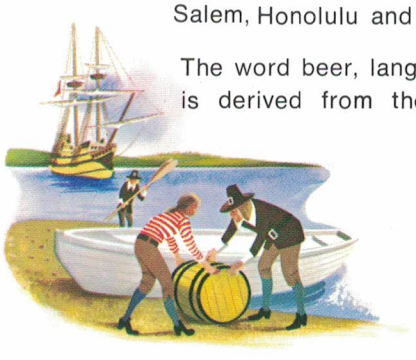
How beer is made



The history of beer

The brewing of fine beer is still an art, just as it has been for several thousand years, even though the methods and equipment have changed and grown more sophisticated. While the general procedures of making beers are similar, there are many subtle differences, and no two brewing companies produce the identical product.

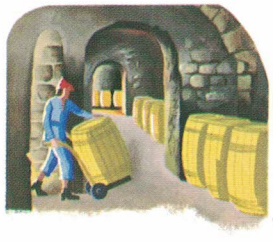
There are millions of beer drinkers all over the world, but few are aware of the great care, the techniques and the controls that are followed in making their favorite drink. For this reason, the Jos. Schlitz Brewing Company presents in this issue a simplified explanation of the careful steps taken in the brewing of its fine beers—Schlitz, Old Milwaukee, Primo—and Schlitz Malt Liquor in its seven breweries located in Milwaukee, Los Angeles, Tampa, Longview, Winston-Salem, Honolulu and Memphis.



The word beer, language authorities agree, is derived from the Latin verb "bibere" which means to drink. It closely resembles the German word "bier" and the French word "biere." One of the reasons the Pilgrims landed the Mayflower at Plymouth instead of Virginia, their planned destination, was their shortage of food "especially our beere," as recorded in a journal of their voyage. In the early days of America, the colonists considered "beere" as their staple beverage, and discovered that the American Indian was brewing a similar grain beverage. Eventually, the final "e" was dropped from the spelling.

As a drink, beer dates back to times before men could write. Tales of beer were passed along through legends and myths by word-of-mouth history. In written history, beer is recorded as far back as 6000 B.C. on some Babylonian tablets which told of brewing being done in the home along with cooking and baking.

The major beers brewed in the United States are called lager beer. The word lager comes from the German "lagern," meaning to store, to rest, to age. One of brewing's many important stages is the lagering period when the beer is placed to rest, allowing it to age for the proper time. Before



the days of mechanized refrigeration, makers of beer discovered its taste improved after storing it in cool cellars and caves. Thus the development of lager beer.

The birthplace of a light colored beer that had a more than customary flavor of hops was Pilsen, Czechoslovakia. This beer came to be known as pilsener. It is a type of lager beer that is characteristic of most beers now brewed in the United States.

Although its appearance is similar to beer, the taste sensation of malt liquor is different because it is brewed with several varieties of malts and hops. Its flavor has been called bold, strong and unique because of its robust character. Part of malt liquor's proof of quality is that a properly chilled glass of it does not have the foamy head common to beer. Experts say its taste is at its best when served very cold.

A beer brewed in Einbeck, Germany, around the 13th century, became known by the town of that name. The sound of "Einbeck beer" was gradually garbled into "ein bock beer," and this eventually became "bock beer." In translation, "ein bock" means "a goat." Consequently, a goat's head has often been used as a symbol in identifying the product. Originally this beer was brewed especially for spring festivals and it was made darker than other beers. As a holdover of this tradition, some breweries in the United States produce a small amount of bock beer near the springtime of the year.

Alcoholic content has little to do with the taste of beer. Maximums of alcoholic content in the United States are determined by law and can differ from state to state. In general, these laws range from about 5% to about 3.2% by weight and apply to all beers, whether produced or sold in the particular state. Fermented malt beverages that have a greater alcoholic content than the maximum allowed for beer by law, must be called by a name other than beer.

In the brewing of ale more hops are added and a different strain of yeast is used than in beer. During fermentation the yeast rises to the top of the product, whereas in beer the yeast settles to the bottom. The overall taste of ale is generally heavier and more bitter than beer.

Porter is a malt beverage in which dark malt is used in the brewing process and the finished product is darker and sweeter than either ale or beer.

Originally the name of stout was used to signify strong or stout beer. It is a dark brew to which licorice is added. Stout is brewed of greater strength and with a greater proportion of hops than is porter, and is even sweeter due to its marked flavor of malt.

Ale, porter and stout are more popular in Britain and the Dominions than in America.

Ingredients

Malt, rice or corn, and hops (above) plus water constitute the basic ingredients of beer.

Quality brewing requires the careful selection of quality ingredients, regardless of the cost. These ingredients are chosen by experts so they can be used by the experts who brew quality beer.

Barley, which is turned into malt, is the basic ingredient in beer. A special type of barley is grown for the purpose of brewing and it is raised in the middle and northwestern states.

Rice or **Corn** is an adjunct grain used to give beer a light body. It is used because the American taste demands a lightness that malt alone does not produce.

Hops give beer its distinctive taste and aroma. They are like spice added to food. Without hops beer would taste sweet. They are grown in the west and the northwest.

Yeast is used to ferment beer. While it is essential to the brewing process, it does not remain in the finished product. The same pure culture yeast strain has been used by the Jos. Schlitz Brewing Company for many years.

Water is a very important ingredient in brewing. Its consistency varies according to seasons and areas of the country; but at Schlitz water is conditioned as required so that the results of brewing are always uniform.

Obtaining the highest quality ingredients is the beginning of making the highest quality beer—but only the beginning. Getting the best out of the ingredients by blending and brewing them perfectly for the finest taste is the secret of success.

The first step in making the finest beer is to obtain the finest barley. The brewing process begins with the malting of barley. Barley malt is the basic ingredient of beer because it supplies those qualities and characteristics required to produce excellent beer. Rigid control of time and temperature is demanded to change barley into malt.

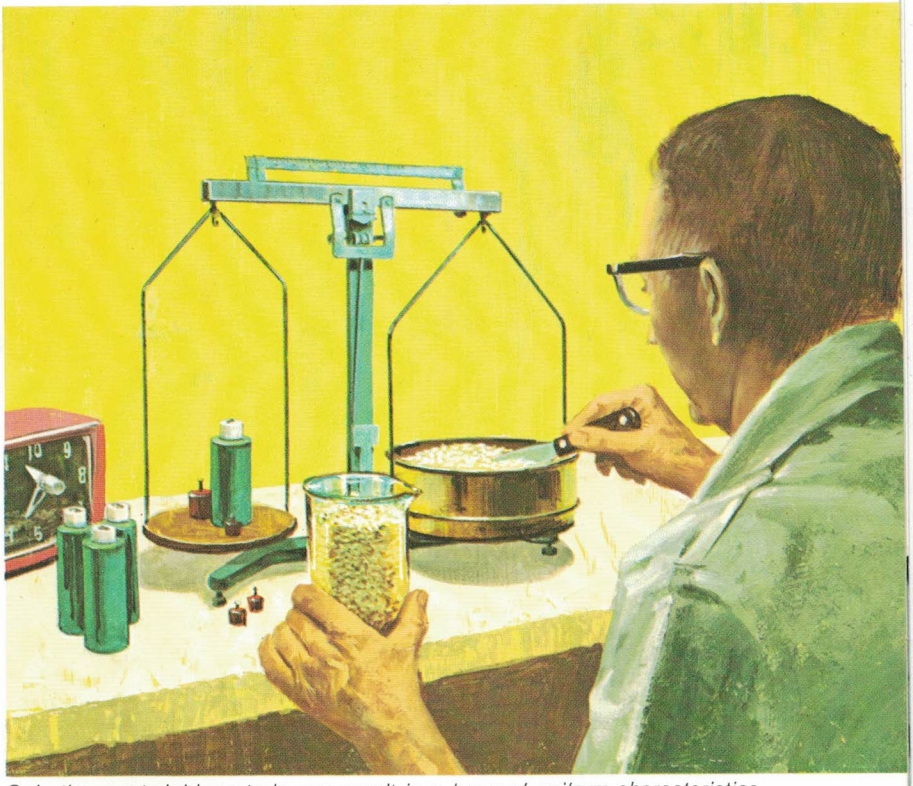
After the barley kernels are cleaned, they are steeped in aerated water and made to germinate under carefully applied moisture and heat. (See page 6). When growth has reached the precise point of excellence for yielding the best malt, the moisture is removed and the grain is transferred to a kiln where it is dried and germination ceases. Sprouts, developed during the processing, are removed and only the starches of the barley kernels remain. This is the malt, whose flavor and quality are created through perfect timing in aging and mellowing.

When the malting process is completed, the malt is crushed and blended with water, and mashing begins. To this boiling combination is added the adjunct mash of previously cooked rice or corn. Enzymes natural to malted barley liquefy the grains and perform a chemical change: conversion of starches into fermentable sugars. Once more—to determine the type and quality of beer—precise control is necessary. Most of the sugars produced in the mashing process provide the alcohol and carbon dioxide gas in beer. Some nonfermentable sugars contribute part of the body and flavor.

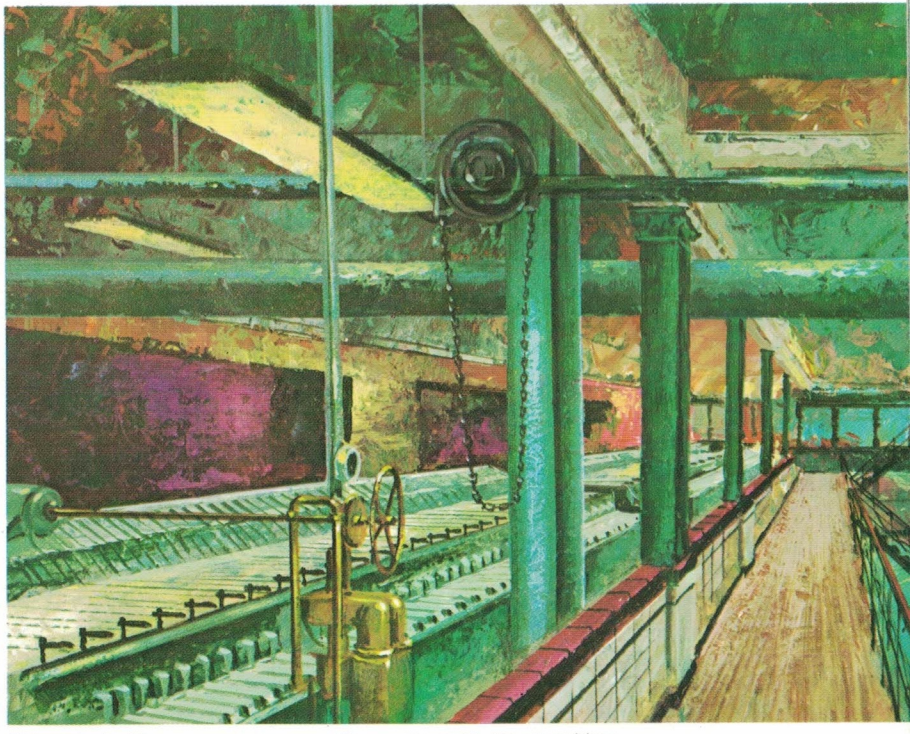
When the mash of malt and adjunct has reached the proper time, the grain is removed by filtering. The liquid becomes a clear filtrate called wort which next flows into the brewing kettles. Boiling the wort further removes excess water in preparation for the addition of hops.

At just the right moment, when the hops have imparted their unique flavor and aroma, the boiling wort flows through filters leaving behind the leaves of the hops. The clear liquid then passes through coolers which bring the temperature down in a matter of seconds.

Meanwhile, the pure yeast culture has been prepared for its role in the Schlitz beer story.



Only the most rigid controls can result in a brew of uniform characteristics.



This mash filter press removes the grain and the resulting clear liquid is called "wort".

Steeping Tanks, where barley kernels germinate and sprout under moisture and heat. Sprouts are removed, and the remaining barley starches become the mellow flavored malt.

The cooled wort next flows into fermenting tanks where the yeast is added, starting fermentation. Since beer is a fermented malt beverage, the liquid in fermentation ceases to be wort and begins its life as beer. In the fermenting tanks the yeast performs its carefully controlled work of transforming the fermentable sugars into alcohol and carbon dioxide gas, the gas that makes the beer foam. During fermentation the excess carbon dioxide that is generated is watchfully removed, liquefied and stored for later reintroduction to the beer in the exact amount required for excellence and the necessary sparkle of the product.

After the fermentation process is finished, the yeast is removed and the beer is piped into glass-lined storage tanks for aging and mellowing. This is called the lagering period, the final stage in brewing where further perfect control and watchful testing are essential. After lagering — resting and aging — in 30 degrees temperature, the beer is filtered several more times to assure the highest purity and clarity. When it has reached its peak in taste and quality it is the moment for packaging in bottles, cans and kegs.

From the time fermentation begins, the beer is protected from air, and this protection is maintained all through the packaging operations, which guarantees the product a longer shelf life and evenness of flavor.

To insure purity and to preserve the clarity of the product when it is packaged, non-draught beer is put through the heating and cooling process of pasteurization after being sealed in bottles and cans.

The beer for draught kegs goes directly to the racking room where it is immediately put into the kegs. Since it is kept refrigerated right up until it is served, keg beer does not require the special filtration of bottled and canned draught beer, nor the pasteurization of regular beer.

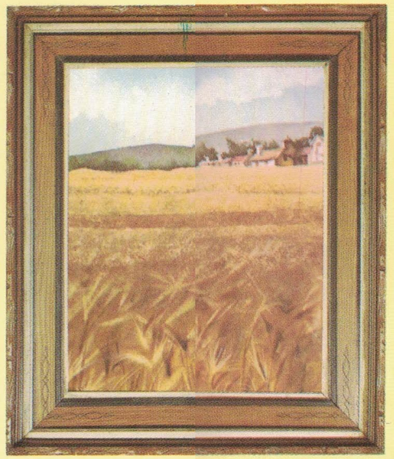
Because it receives still further specialized filtering, draught beer destined for bottles and cans does not require continuous refrigeration nor pasteurization after it is packaged.

Frequent sampling checks are made on the beer during the lagering process.

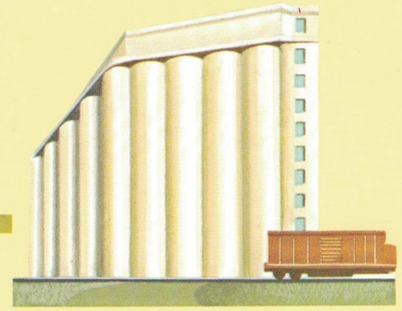
Every Jos. Schlitz Brewing Company product — Schlitz, Old Milwaukee, Primo — receives the same controlled care in brewing, each according to its own special formula. And the same watchful steps are taken in the making of Schlitz Malt Liquor, from the choice of the best ingredients through exacting controls of amounts, temperature and time. Several varieties of malts are selectively blended and three varieties of hops are added to give malt liquor its own particular flavor and distinctive tart tanginess.

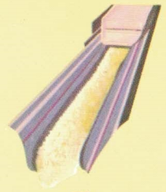
A racking room worker hammers home the bung in a keg of beer.

How beer is made...flow chart

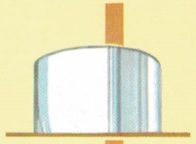


1. GRAIN ELEVATORS: Here is where barley grain is stored, graded and cleaned.

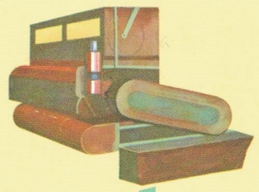




2. MALT HOUSES: Under controlled moisture and heat, grain germinates, then is dried, cleaned and stored.

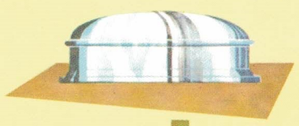


3. CLEANING: As needed for brewing, malt is withdrawn from storage and cleaned again.

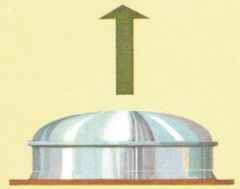


4. MILLING: Malt is crushed to allow its inner goodness to escape later in the mash tub.

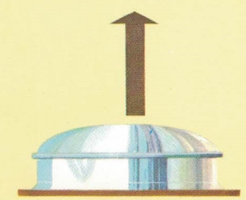
5. WEIGHING: To determine exact amounts, malt is weighed, as is the adjunct of rice or corn.



6. COOKER: A small portion of malt is cooked with the adjunct until the starch is liquefied.



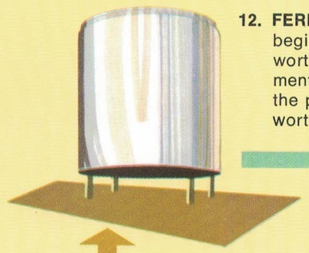
8. LAUTER TUB: Lauter means clear, and this is where the clear liquid called wort is removed and the grain particles remain. (The spent grains are rich in protein and are used as livestock feed.)



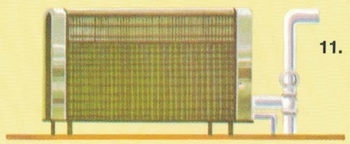
7. MASH TUB: The malt is blended with water in the mash tub, where it is joined by the cooked adjunct mash, completing the mashing process.

9. BREW KETTLE: The wort flows into the brew kettle where boiling removes excess water and the hops are added to impart their unique flavor.

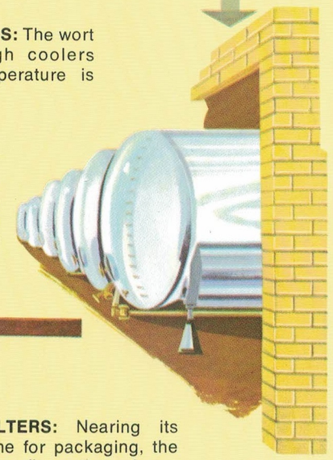
10. HOP STRAINER: When the brew kettle operation is ended, the wort flows through the hop strainer where the hops are removed.



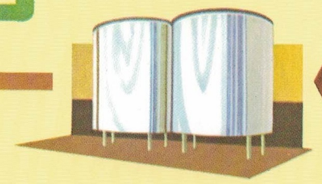
12. FERMENTER: Fermentation begins when the chilled wort flows into the fermenter and is joined by the pure yeast culture. The wort now becomes beer.



11. WORT COOLERS: The wort passes through coolers where its temperature is cooled quickly.

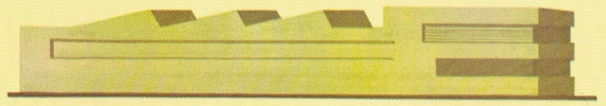


13. STORAGE TANK: When the yeast has performed its task, it is separated from the liquid and the beer flows into the storage tank for aging and mellowing.



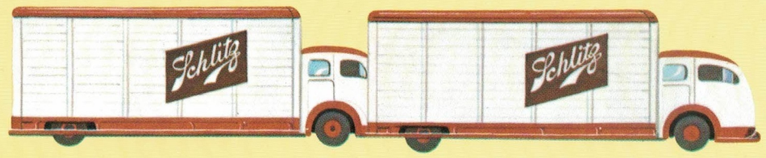
14. FILTERS: Nearing its time for packaging, the beer flows through a filtering process.

15. PREFILTRATION STORAGE: From the previous filtering stage, the beer passes into a storage tank where it is held in readiness for packaging.



16. FILTERS: On its way to being put in bottles, cans and kegs, the beer is filtered for a final time.

17. PACKAGING: Bottles, cans and kegs are sterilized, then filled, then sealed. Draught beer in kegs is kept refrigerated until served. Bottled and canned beer goes through a pasteurizing process. Draught beer in bottles and cans receives a special kind of filtering so that it requires no pasteurization or constant refrigeration.



Schlitz

Old Milwaukee BEER

SCHLITZ MALT LIQUOR

PRIMO HAWAIIAN BEER

controls

for consistent quality and distinctive taste

Keeping the product up to established standards and in tune with the changing tastes of the times is a never-ending problem in the brewing industry. To accomplish this in the most efficient and thorough way, most breweries adhere to a program of continued research and quality control. And they, like many others, have turned to automation to acquire speed and efficiency and eliminate, to a great degree, the factor of human error. On these pages are shown some, but by no means all, of this kind of equipment utilized by the Jos. Schlitz Brewing Co.

The Laboratory is the Hub

The laboratory, operating with a large staff of scientifically trained brewing specialists, is the source of quality control and innovative control procedures. One of the laboratory's most effective and versatile tools is the pilot plant, a midget brewery complete in every detail. Through its use, new barleys and other ingredients can be tested without incurring the ex-

This "midget brewery" duplicates the exact functions of the full-sized brewing operation without the use of ingredients necessary to make a full batch.

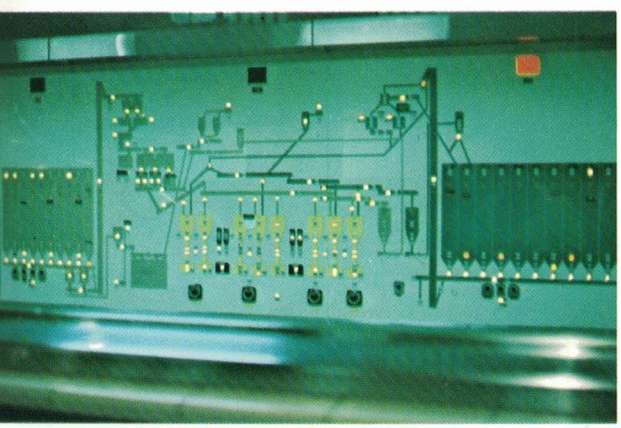
pense and inconvenience of brewing a full batch of beer involving thousands of gallons. It is one of the ways the Jos. Schlitz Brewing Co. safeguards product quality.

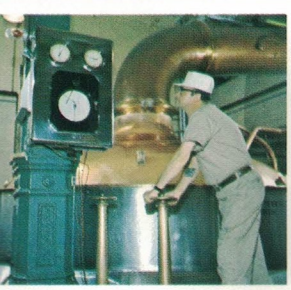
Automation Important

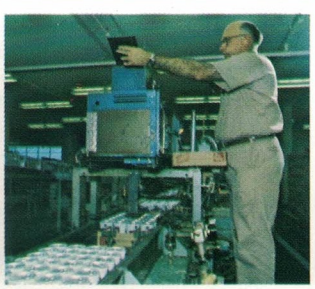
Like any modern, well-organized manufacturing facility, the Jos. Schlitz Brewing Co. has computerized and automated many of its research and brewing operations in the name of speed, efficiency and accuracy. The computer shown handles statistical matter related to quality control and other laboratory functions, while the control panel automatically regulates a complex grain handling system with high level efficiency frequently missing in manual manipulation.

Multi-Brands Multiplies the Problem

Quality control and public preference trends are problems for any brewery, but they are multiplied many times over for breweries, like the Jos. Schlitz Brewing Co., that market several brands. Despite — or perhaps because of — its multi-brand operation, the Jos. Schlitz Brewing Co. has kept abreast of the ever-changing brewing industry picture and will continue to do so as the exigencies of the times demand.







Get acquainted with the family

Four great brews, each with a taste, a character, a heritage all its own. You'd have to travel a bit to try them all, but we think you'd agree it's worth it.

Jos. Schlitz Brewing Co., Milwaukee, Wisconsin 53201
Produced by the Creative Planning & Development Dept. April, 1972. Part No. 85196